REMARKS

Claims 1-19, 21-23, 26-30, 40-42, 48, 65, 66, 68-71, 75-82 and 84-119 are pending in this application. In this response, claims 48, 65, 69, 75, 96, 112 and 113 are amended and new claims 120-125 added. However, the claim amendments are made to clarify the scope of the invention and to correct minor errors. None of these amendments are relied on as a basis for overcoming the present rejection over Lang. Finally, claims 22, 23, 27-29, 65, 66, 68-71, 106 and 107 are withdrawn from consideration but remain in the application.

Claims under Examination

As an initial matter, the claims under examination must be properly identified. A number of telephone calls have been made to the Examiner since the office action was received, however Applicant's Representative was unable to reach the Examiner to resolve this matter before the expiration of the TWO MONTH period after the mailing date of this final office action. Applicant thus respectfully requests a new office action that addresses all pending claims and that the new office action date be reset with a new period of response.

It is the Applicant's position that prior to the addition of claims 120-125 herein, the claims pending in the application are:

Claims 1-19, 21-23, 26-30, 40-42, 48, 65, 66, 68-71, 75-82 and 84-119

Of those claims, claims 22, 23, 27-29, 65, 66, 68-71, 106 and 107 are withdrawn from consideration in light of previous election requirements that the applicant has traversed.

The "Disposition of Claims" as stated by the Examiner on page two of the Office Action is erroneous because it omits claims 26-29, and 48 and includes canceled claim 67. Moreover although the Applicant has traversed the Election requirement because the claims are not directed to an undue number of species, given the species provisionally elected by the Applicant, claims 27-29 and 107 should be additionally listed as withdrawn.

The failure to properly address claim 48 is not a new issue. This has been a recurring difficulty that was raised in previous office action responses. For example the following is a

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quotation from the last response filed June 12, 2009, which quotes the prior response filed October 22, 2008:

> As an initial matter the status of the claims under examination and withdrawn must be clarified. In the prior response to the election requirement, filed October 22, 2008, applicant made the following election:
>
> "**Election**
>
> In response to the election requirement, Applicant elects the species of animal processing waste for examination at this time. Claims 26, 30, 75-82, 84-86, and 105 read on the elected species. Claims 1-19, 21, 40-42, 48, 87-104 are generic."
>
> Oct. 22, 2008, Response, p. 9. However, in spite of this election, the present office action mistakenly includes the generic claims in the listing of the claims that were withdrawn and the rejections do not purport to address the generic claims other than claim 1.

The omission of claim 48 is particularly problematic because claim 48 is an independent claim that Applicant believes defines over the cited art, but which the Examiner has neither indicated as allowed nor rejected. Therefore it is unknown as to what extent, if any, the Examiner believes the currently cited prior art to be applicable to claim 48.

For these reasons, if the Examiner will not allow the application, Applicant respectfully requests a new office action that addresses all pending claims with a new period for response.

Claim amendment made herein

The claim amendments and additions made herein are made only to correct minor errors, clarify the invention claimed and ensure the Applicant has claimed the full scope of the invention. No amendments made herein are relied on in any way to overcome the current rejections over Lang. As such, the amendments create no new issues and do not necessitate a new search and are therefore appropriate for entry after final rejection.

Rejections Under 35 USC 103

The rejection of "claims 1-19, 21, 30, 40-42, 75-82, 84-105 and 108-119," as obvious over Lang is respectfully traversed and reconsideration requested in light of the remarks set forth herein. The reference to Lang discloses a process of making alcohol involving dilute acid hydrolysis to form sugars suitable for fermentation. Thus, contrary to the unsupported assertions

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by the Examiner, the process disclosed by Lang is unsuited for the production of oil and could not produce oil if operated as intended, disclosed and taught.

In the "Response to Arguments" section the Examiner makes the unsupported assertion that "Since Lang utilizes a feedstock as claimed and hydrolysis the feedstock [sic] as claimed, it would be expected that at least a small amount of oil is produced in the step." No factual support is provided for this assertion. There is no basis for this assertion because the processing of the feedstock in Lang is dramatically different than in the present invention, even if the feedstocks start out the same. Lang employs extensive pre-processing of the feedstock before the disclosed hydrolysis step such that the material actually hydrolyzed is radically different than with the present invention. In particular, Lang employs a steeping (8) and flotation (9) steps "during which the hydrolyzable materials become preferentially heavier by absorption of water and sink while the non-friable plastic films, waxed paper, etc. do not absorb water and hence float. These materials are separated in flotation step 9." [col. 2, lns. 15-18]. Thus, Lang does not hydrolyze the entire feedstock. Floatable materials include not only plastics as stated but fats and fatty acids from animal wastes. Clearly fat is incapable of becoming "preferentially heavier by the absorption of water." Thus the fats and plastics, components which might result in the production of oil are removed prior to the hydrolysis step.

This is consistent with a process intended to produce sugars for downstream fermentation. The presence of oil in the process stream would be undesirable as it would foul the fermentation reactors and reduce the efficiency and increase maintenance costs. The Lang process thus intentionally avoids the production of oil rather than allowing it.

In addition to the fundamental error in understanding the prior art as explained above, the claims of the instant application contain numerous limitations that define over the prior art.

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Claim 48

Neither claim 48 nor its limitations have been addressed by the Examiner in the office action. The sequence of steps recited in claim 48, including:

reacting to produce, inter alia, a reacted liquid product,
lowering temperature and pressure on the reacted liquid product to produce an intermediate feed,
separating at least one mineral from the intermediate feed to produce a mixture of reacted liquid produce and water,
diverting the water, and
converting the reacted liquid product,

is not disclosed or suggested in the reference.

In contrast, after the hydrolysis of Lang, which the Examiner erroneously equates to the claimed reacting, the products of hydrolysis are filtered and the filtrate is flash evaporated. After flash evaporating, the remaining concentrate is sent to fermentation. As can be seen, filtration after hydrolysis does not correspond to the sequence of steps recited. Morever, use of an evaporator, which uses applied heat to concentrate the liquid, is a dramatically different process than lowering temperature and pressure as recited. There is simply no correspondence between the claimed steps and the process steps of the cited reference.

Finally, claim 48 recites the production of a hydrocarbon liquid. Other than the Examiner's unsupported insistence that some oil must be produced in Lang, there is no support suggestion that Lang would produce oil The hydrolysis reaction of Lang would not, in fact, produce any oil or other hydrocarbon liquid for the reasons explained above. Thus this final limitation is also not met.

For these reasons claim 48 is patentable over the cited reference. The arguments offered by the Examiner that pre-heating and the recited temperatures and pressures would be obvious do not overcome the clear lack of correspondence between the reference and the claimed step. Claim 48 and the new claims dependent thereon (added only to address the full scope of the invention and not for reasons of patentability related to the current rejection) are thus in allowable form.

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Claim 75

Claim 75 recites to specific heating steps before the reacting step, steps with specific effects that are not addressed by the Examiner. The Examiner asserts, without any factual support, only that it would have been obvious to heat the feedstock "as claimed because it would be expected that heating the feedstock to the reaction conditions would improve effectiveness of the process." The first problem with this statement is that there are no stated reaction conditions for the hydrolysis in Lang. It is well known that dilute acid hydryolysis to produce sugars for ethanol production as disclosed in Lang can occur over a wide variety of operating conditions including low temperature and ambient pressure. See, e.g., Farina et al., Fuel Alcohol Production From Lignocellulosic Feedstocks, Energy Sources, Vol. 10, 231-237 (1988) ("A two-stage, low-temperature, ambient pressure, acid hydrolysis process [to convert cellulose] to fermentable sugars"); and Roca et al., Enzymatic Hydrolysis an Fermentation of Pretreated Cashew Apple Bagasse with Alkali and Diluted Sufruric Acid for Bioethanol Production, Applied Biochem and Biotech, vol. 155, No. 1-3, May 2009, pp. 104-114 (hydrolysis at 45°C). Copies of these are enclosed. In fact, a person of ordinary skill in the art would presume that Lang operated in this low temperature and low pressure realm because Lang specifically states that the operation under conditions of high temperatures and pressures is "disadvantageous." [Col. 1, lns. 20-25].

But claim 75 does not merely recite heating or pre-heating. Claim 75 recites a staged heating at three different temperatures, each with different effects: an initial temperature, a first temperature and a second, higher temperature. Even if it were obvious to preheat as asserted by the Examiner, this specific sequence is not obvious.

Moreover, heating to different temperatures is for different reasons also not disclosed or suggested. Claim 75 first recites an initial heating to an initial temperature "sufficient to maintain the slurry in a liquid state and limit biological activity in said slurry." Lang need not be concerned with maintaining a liquid state because all of the fat constituents that would coalesce at lower temperatures are removed by the floating process as explained above. Also, without the fats, the concern about unwanted biological activity is reduced.

Next, the first temperature is sufficient to break down protienaceous materials in the slurry and drive off ammonia. Again, this is a specific operating parameter that is not disclosed or suggested in Lang and which cannot be met by pure speculation on the part of the Examiner.

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Moreover, the heating at the first temperature creates a "conditioned slurry" as recited. That is a slurry with proteins broken down and ammonia driven off. It is only this slurry that is subjected to the reacting step to hydrolyze material in the conditioned slurry. A process staged in this manner is not suggested by the cited reference.

Claim 75 also recites that the reacting occurs at a pressure of at least the saturation pressure of water in the conditioned slurry. The Examiner asserts regarding Lang that "since the reaction zone is operated under hydrolysis, it would be expected the pressure in the reaction zone is at least at the saturation pressure of water." However, there is no reason for this expectation. As mentioned above, no conditions are disclosed for the hydrolysis in Lange. As also explained above (see Farina article; 100C at ambient pressure is below saturation pressure), it is known that a hydrolysis reaction of the type described in Lang to produce sugars for fermentation can be conducted at ambient pressures, thus below the saturation pressure.

Claim 75 finally recites that the converting step produces hydrocarbon oils. This is not disclosed or suggested, or possible with Lang for the reasons explained above. The Examiner's unsupported assertion to the contrary does not qualify as evidence to reject the claim.

Claims dependent on claim 75 recite further limitations that are further patentable over the cited reference. For example, claim 76 recites the specific temperature of the reacting step as being between about 150C-330C. Claim 78 recites a specific temperature of about 250C. Claims 79 and 80 recite specific pressures between 20-120 atmospheres and about 50 atmospheres, respectively. In the absence of any operating conditions stated in Lang, the Examiner asserts it would have been obvious to use any temperature or pressure. This is respectfully traversed. A person of ordinary skill in the art would not consider operating Lang at high temperatures or pressures because Lang specifically states such are "disadvantageous" as explained above. Thus, in light of the clear teaching away from high pressure and temperature, and in light of the articles showing that operation sugar producing hydrolysis reactions at temperatures of 100C and lower and at ambient pressures, a person of ordinary skill in the art would not modify the Lang process to operate in the recited temperature range.

Claim 77 further recites that **the converting step** takes place at a temperature in the range of about 300C to 525C. The Examiner has equated the fermentation and subsequent steps of Lang to the recited converting. There is no reason whatsoever to presume that fermentation

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would happen at 300C or greater. The sugars and yeast would simply burn up at those temperatures. There is no basis for the rejection of this claim.

Claim 96

Claim 96 again discloses a specific sequence of steps not suggested by Lang, a sequence that the Examiner does not address in the rejection. First, for the reasons explained above, Lang does not disclose heating to limit biologically activity in the slurry before the reacting step. Claim 96 also recites decomposition and hydrolysis reactions. But decomposition as defined in the instant application requires high pressure and temperature (see para [0061]), contrary to the purpose of Lang (see col 1, lns 15-25]. Since hydrolysis for the purpose of making sugars can take place at lower temperatures and pressures (see Farina and Roca articles cited above) a person of ordinary skill in the art would not be motivated to operate the Lang process so as to produce a decomposition reaction in addition to the hydrolysis at high temperature and pressures required.

After the reacting steps, claim 96 recites two different separating steps to obtain a fuel oil. The first separating step separates liquid, gaseous and solid fractions produced in the reactions. There is no separation of a gaseous fraction disclosed at this point in the Lang process, which would be expected for a low temperature/pressure operation as described. But claim 96 goes further to recite a second separating of water from the previously separted liquid fraction to produce a fuel oil. While Lang does disclose downstream water removal after the fermentation, the product is ethanol, not a fuel oil.

For all of these reasons, claim 96 is patentable over the cited reference. In addition, the claims dependent on claim 96 are further patentable over the cited references in light of their further limitations. For example claim 97 recites that the decomposition reaction comprises deamination and decarboxylation. This is not disclosed or suggested in Lang and would not be possible at low temperature operation as suggested by Lang. Claim 98 requires the decomposition and hydrolysis reactions to occur simultaneously, once again not possible if Lang employs a low temperature hydrolysis as suggested.

Claim 101 further recites that the temperature of the hydrolysis reaction is between about 200C to about 290C. This is the temperature range in which fats are hydrolyzed into fatty acids and glycerols (see para [0088]) as one of the precursors to forming a useable fuel oil. Since fats

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are skimmed off before hydrolysis and Lang operates in a low temperature regime, as explained above, this limitation also cannot be met by Lang and a person of ordinary skill in the art would not modify Lang to attempt to achieve it.

Claims 103 and 104 further recite fractional distilling and cracking steps conducted on the oil produced as a result of the claim 96 steps. There is simply no suggestion of such steps in Lang and no reason to add or modify such petroleum processing steps to the alcohol production process of Lange. Moreover, the Examiner has offered no reason why a person of ordinary skill in the art would arrive at the steps in combination with the Lang disclosure.

Claim 1

Claim 1 recites a sequence of steps in which there is first a heating to breakdown components of the slurry to produce a conditioned slurry and then a reaction to hydrolyze materials in the conditioned slurry. This is a specific, two step process (as part of the larger recited process) that is not disclosed or suggested by Lang. This is particularly so in light of the teaching by Lang to avoid high temperatures and pressures, which are necessary for the breakdown of slurry components. The mere assertion by the Examiner that it would have been obvious to pre-heat does not meet these claim limitations.

Claims dependent on claim 1 provide further limitations that further support patentability over the recited reference. For example, claims 2-4 and 40 recite that the useful materials produced are carbonaceous, carbon solids and/or hydrocarbons including fuel gas and oil. There is no suggestion that these materials be produced by the process of Lang and the Examiner's speculation that oil might be produced is nothing more than speculation. As explained above, Lang would not produce oil because to do so would be contrary to the intended result of producing and fermenting sugars. Moreover production of carbon solids and related hydrocarbons requires application of high temperatures and pressures and high pressure vessels, contrary to the intent of Lang.

Claim 5 recites driving of ammonia as part of the slurry preparing process. The Examiner makes no attempt to find this limitation in the art. Removal of free ammonia, especially when the feedstock comprises animal processing wastes, is described in para [0083] of the instant application. As described therein, such may include separation of urine content prior to slurrying, use of enzymatic degradation, application of heat or conversion to salt by

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acidification. No such processes are suggested or disclosed by Lang and there is no reason that a person of ordinary skill would add such a processing step to Lang.

Claims 6 and 7 specify high pressures and claim 8 specifies a high temperature range for the recited first reaction. The disclosure of Lang specifically teaches away from high temperatures and pressures as discussed above and given the knowledge in the art as shown above that hydrolysis can be conducted at low temperature and ambient pressure to achieve the fermentable sugars produced by Lang, there is no reason for a person of ordinary skill in the art to modify the Lang process to operate at the recited high temperature and pressure ranges.

Claims 13 and 14 further recite that the reacting drives off steam and that the steam is redirected to the slurry during the preparing stage. No such steps are disclosed or suggested in Lang and once again, no rational is offered by the Examiner for the rejection of these claims. Given the teaching away from high temperature and pressure, a person of ordinary skill in the art would not be motivated to generate steam or to divert it to earlier in the process stream of Lang.

Claim 16 recites that the at least one reacted liquid product (which is produced by the reacting step) comprises a fat derivative or fatty acid. Since, as explained above, the Lang process skims off all floatable materials in the feedstock, none of the fats in the feedstock would be hydrolyzed and no fat derivative or fatty acids would appear in the product of that reaction. This is completely consistent with the intent of Lang to produce sugars for fermentation where such fat products would foul the downstream fermenting apparatus. Claim 16 is further patentable for this reason.

Claims 18 and 19 recite diverting a portion of the reacted liquid product prior to the primary converting step and then converting that diverted portion into a specialty chemical, with the specialty chemical being a fatty acid. No such steps or products are disclosed or suggested in Lang. To the extent the Examiner considers the Fermentation to be the converting step of claim 1, there is no diversion of any product of the hydrolysis prior to that step except back into the hydrolysis.

Claims 87 and 88 recite that the converting comprises separation of water and from the reacted liquid product and the production of fuel oil thereby. As explained above, Lang cannot produce fuel oil and the Examiner's bald assertions that it could without support in the art are an insufficient basis to maintain the rejection.

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Claim 89-92 recite further processing conditions of the converting stage involving high temperatures in excess of 300C and cracking of liquid hydrocarbon fuel. There is simply no basis in the disclosure of Lang for asserting that these claims are obvious and the Examiner has made no attempt to do so.

Claims 93-95 further recite the reacting step as decomposing and hydrolyzing to deaminate and decarboxylate the feedstock. Once again, as discussed above, these specific steps are not suggested in Lang and the Examiner has made no attempt to support the rejection of these claims.

For all of the forgoing reasons, claim 1 and the claims dependent thereon are patentable over the cited reference and reconsideration of the rejections is respectfully requested.

Double Patenting Rejection

The obviousness-type double patenting rejection over U.S. Patent No. 7,310,060 is respectfully traversed and reconsideration again requested. In the continued rejection the Examiner has not addressed all of the limitations of claims independent claims 1, 75 and 96 that distinguish those claims from the patent. The differences are not merely a generic pre-heating step and the selection of feedstock as suggested by the Examiner in the last office action. It is respectfully requested that the Examiner address all of the limitations as set forth in the prior response. In view of all those limitations, taken as a whole, it is respectfully submitted that the obviousness type double patent rejection cannot be maintained.

Further Election

Once again, in an attempt to expedite the prosecution of the instant application, Applicant repeats the following elections in advance: Rubber, Mixed Plastics, and PVC. Claims reading on the species Rubber are 22, 23, 65, 66, 68, and 107. Claims reading on the species Mixed Plastics are 22, 69-71, and 106. Claims reading on the species PVC are 28, 29, and 106. The generic claims remain as identified above.

Applicant respectfully requests that, after completing the search for the currently elected Animal Processing Waste, if the current species is found allowable, each other species be searched in the order set forth above without the need for subsequent written election

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requirements. Alternatively, if necessary, Applicant's representative will elect these species in the stated order by telephone to avoid the need for further written election requirements.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application as a whole is in form for allowance. However, should any new issues arise, in order to expedite future prosecution, the Examiner is respectfully requested to contact the undersigned by telephone at 802-846-8305.

No additional fees are believed to be due in connection with the filing of this response. To the extent it is determined that any additional fees are due, please charge such additional fees to Downs Rachlin Martin PLLC Deposit Account No. 04-1588.

Respectfully submitted,

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